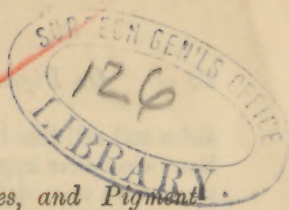






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II.—On Pigment-Flakes, Pigmentary Particles, and Pigment Scales. By JOSEPH G. RICHARDSON, M.D. Microscopist to the Pennsylvania Hospital.

THE present paper is designed to direct attention to what I conceive to be an egregious error, by which several microscopists of acknowledged ability have been ensnared,—namely, a belief in the importance of the “pigment-cells” or “scales” described by Frerichs, of Berlin, as occurring in blood;\* of similar bodies found by Drs. Meigs and Pepper, of this city, under like circumstances;† and of the “pigmentary particles” or “celloids” figured by Dr. William Roberts, of Manchester, England;‡ most, perhaps all of which I assert to be simply and solely accumulations of dirt (especially the remains of red blood-corpuscles) in the little excavations on slides in ordinary use.

Such an accusation as this will, no doubt, at first excite astonishment or even ridicule, but of course no sane man would dare to bring forward a charge of this kind without strong evidence in its favour. This evidence I ask each one of my readers to furnish me after trying this simple experiment:

Examine an ordinary plate-glass slide microscopically for dirt-pits containing brownish-red matter which may be oxide of iron (the remains of the polishing powders used in its manufacture), or, if the slide has been long in use, old red corpuscles. If there are none already filled up with “pigment,” rub in faithfully a little blood, by which means you can sometimes fill the shallow cavities with the débris of the red disks, and so imitate quickly the effect probably often produced in a gradual manner by frequently wiping small quantities of blood over the glass. Lastly, clean off the slide perfectly bright (so as to be sure you leave nothing but artificial cells upon it), and examine with a power of 250 diameters.

The bodies you probably find are accurately described by Dr. Roberts as follows:§ “Pigmentary particles; these objects deserve a passing notice from the fact that they are frequent, almost constant, if not absolutely constant, objects in urinary deposits, and have not hitherto been described. . . . They never exist in such quantity as to form the entire (*sic*) of a visible urinary sediment; they are only to be recognized by the microscope. They appear especially under two conditions—namely, as free amorphous par-

\* ‘Clinical Treatise on Diseases of the Liver.’ Sydenham Soc. Translation, London, 1860, vol. i., p. 320.

† ‘Pennsylvania Hospital Reports,’ Phila., 1868, p. 108.

‡ ‘Urinary and Renal Diseases,’ second American edition, Phila., 1872, p. 125.

§ *Op. cit.*, p. 124 *et seq.*



ticles and cell-like bodies (or celloids). . . . The cell-like particles have a peculiar appearance, very difficult to explain. They never present an unmistakably cellular character; they appear flat, never spherical. Their outline is generally an oblique ovoid. Within this outline, which is generally of exceeding delicacy and of perfect definition, lie masses of red or orange pigment, exactly resembling the free amorphous particles already described."

Frerichs, after pointing out somewhat similar objects, says\* that accurate diagnosis can be made in malarial fever by examining the blood for them, since a few drops "are sufficient to determine the presence or absence of large quantities of pigment."

Drs. Meigs and Pepper report finding pigment-particles in the blood of eighty-nine patients; but later these acute observers seem to have had shrewd misgivings respecting their importance, although without feeling satisfied as to their real origin.

My own suspicions were excited years ago by Frerichs's pigment-scales, and experiments on hundreds of specimens of blood from malarial and other cases convinced me of their delusive character.

Very recently, Dr. James Tyson, of this city, whilst examining in committee some ovarian fluid, pointed out to me several of Roberts's pigment-flakes, and said he had prepared drawings of these bodies for his forthcoming work. His statement naturally led me to a careful and prolonged study of the objects in question, and this in turn forced upon me the conviction above expressed.

Excluding carbon-particles (from the air), which can generally be found in fluids which have not been secluded from the atmosphere, I attribute the peculiar shape of pigment-flakes which Roberts finds so "very difficult to explain" (admirably shown by Dr. Tyson in his plate), to the conchoidal figure of the minute chipped-out cavities in plate-glass; which little pits have, indeed, proved veritable pitfalls to unwary travellers over the microscopic field. These same shallow shell-like excavations, before being filled up with dirt, are, probably, Frerichs's "coagula of a hyaline character, which resemble in form" (as they have a perfect right to do) the pigment-flakes, and are also Roberts's "bluish mother-of-pearl" celloids.

Dr. Roberts concludes, "I have been in the habit of noticing these objects for many years, and have regarded them as derivatives of hæmatin, but how they come to assume their peculiar forms I cannot conjecture." With him, I believe them occasionally to be "derivatives of hæmatin," but only by the *rubbing process* detailed above; and I trust that my "conjecture" as to how these hæmatin-flakes "come to assume their peculiar forms" will be satisfactory.

It seems almost incredible that the recorded appearance of these

\* *Op. cit.*, p. 355.

“ flakes ” in such various and inconsistent localities—viz. in blood, urine, the brain, in tumours, and even in the breath—has hitherto aroused no suspicion of their true nature ; and it is only when we remember how few investigators have minds achromatic enough to enable them to see objective facts without subjective colouring, that we can offer a plausible explanation of this remarkable phenomenon. Does not the delusion which, if I am correct, has thus entangled several eminent observers, form one of the most curious episodes in the history of medical microscopy ? and should it not serve as a warning to future generations of students ?

Nevertheless, being always open to conviction, I hereby challenge any devout believer in pigment-flakes to bring me an honest specimen of urine, or blood from any ordinary case of disease, in which can be demonstrated either pigment - flakes, pigmentary particles, or pigment-scales.

PHILADELPHIA, *November 7, 1874.*







